

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

Claims 1-18 (canceled).

19. (currently amended): A film-forming device with a substrate rotating mechanism, which comprises:

a susceptor in the form of a circular disk and provided at an outer periphery thereof with a revolution input section;

a base plate positioned below the susceptor and rotatably retaining the susceptor via a bearing supported between bearing grooves each provided at the susceptor and the base plate;

a first rotating mechanism including at least one revolution generating section, the revolution generating section rotating the susceptor at the outer periphery of the susceptor by way of ~~imparting~~ generating a rotating force ~~to~~ at the revolution input section wherein the revolution generating section and susceptor are coplanar;

a plurality of substrate tray retaining sections positioned circumferentially around a rotation axis of the susceptor;

a plurality of annular substrate trays provided at an outer periphery thereof with a rotation input section and rotatably supported in the corresponding substrate tray retaining sections for supporting a plurality of substrates;

a second rotating mechanism including a rotation generating section, the rotation generating section rotating the substrate trays by way of ~~imparting~~ generating a rotating force ~~to~~ at each rotation input section;

a plurality of the substrates ~~retained-being supported~~ in the corresponding substrate trays, the substrates being revolved by the rotation of the susceptor and rotated by the rotation of the substrate trays to apply a certain film-forming process;

a reacting chamber extending across the rotation axis of the susceptor and surrounding the substrate tray retaining sections; and

a temperature control mechanism positioned in the reacting chamber;

~~wherein an area within said reacting chamber immediately above and below a center of said susceptor is unoccupied.~~

20. (previously presented): A film-forming device with a substrate rotating mechanism according to claim 19, wherein each of the substrate trays rotates synchronously with the rotation of the susceptor.

21. (previously presented): A film-forming device with a substrate rotating mechanism according to claim 20, wherein the revolution input section and the rotation input section are formed by gears, and wherein the rotation generating section is a ring-shaped stationary gear, the inner periphery of which is provided with gears meshing with the rotation input section of each substrate tray.

22. (previously presented): A film-forming device with a substrate rotating mechanism according to claim 19, wherein said first rotating mechanism rotatably retains the susceptor via a bearing supported between bearing grooves, each provided at the susceptor and the base plate, and wherein said second rotating mechanism rotatably retains the substrate trays via a bearing supported between bearing grooves, each provided at the substrate trays and the susceptor.

23. (previously presented): A film-forming device with a substrate rotating mechanism according to claim 22, wherein in the first rotating mechanism, the bearing groove of said susceptor and the bearing groove of said base plate are each provided with a horizontal plane and a vertical plane, wherein the bearing groove of said susceptor supports the bearing at an upper support portion and an outer support portion, which position above the bearing and provided in said horizontal and vertical planes, and the bearing groove of the base plate supports the bearing at a lower support portion and an inner support portion, which position below the bearing and provided in said horizontal and vertical planes, and wherein said upper support portion and said lower support portion position at the uppermost position and the lowermost position of the bearing, and the outer support portion and the inner support portion position at both ends of the bearing in the horizontal direction.

24. (previously presented): A film-forming device with a substrate rotating mechanism according to claim 19, wherein each substrate tray retains the substrate on a substrate support with a film-formation plane of the substrate positioned downward.

25. (previously presented): A film-forming device with a substrate rotating mechanism according to claim 22, wherein the substrate trays, the susceptor and the bearings are made from graphite carbon.

26. (previously presented): A film-forming device with a substrate rotating mechanism according to claim 19, wherein said susceptor is provided at a center portion with an opening, and said opening is covered by a cap member, which is made from the material selected from the group consisting of carbon (C), quartz (SiO_2), molybdenum (Mo), tungsten (W), silicon carbide (SiC), silicon (Si) and gallium arsenide (GaAs).

27. (previously presented): A film-forming device with a substrate rotating mechanism according to claim 19, wherein said certain film-forming process is a thin-film growth by Metal Organic Chemical Vapor Deposition (MOCVD) method.

28. (withdrawn): A compound semiconductor made by the film-forming device of claim 1.

29. (withdrawn): A compound semiconductor made by the film-forming device of claim 19.

Claim 30 (canceled).

31. (new): The film-forming device as claimed in claim 19, wherein the revolution generating section is positioned outside the outer periphery of the susceptor in a radial direction of the susceptor.

32. (new): A film-forming device with a substrate rotating mechanism, which comprises:
a susceptor in the form of a circular disk and provided at the outer periphery with a revolution input section;

a base plate positioned below the susceptor and rotatably retaining the susceptor;
a first rotating mechanism including at least one revolution generating section, the revolution generating section rotating the susceptor at the outer periphery of the susceptor by way of generating a rotating force at the revolution input section;

a plurality of substrate tray retaining sections, positioned circumferentially around a rotation axis of the susceptor, revolved with the movement of the rotated susceptor; and

a plurality of annular substrate trays each provided at the outer periphery with a rotation input section and rotatably supported in the corresponding substrate tray retaining sections,

revolved with the movement of the substrate tray retaining sections, for supporting a plurality of substrates;

a second rotating mechanism, fixed with respect to the base plate, including a rotation generating section, revolution of each annular substrate tray rotating itself using a meshing point between the rotation generating section and the rotation input section and the substrate tray retaining sections, a plurality of the substrates being supported in the corresponding substrate trays, the substrates being revolved by the rotation of the susceptor and rotated by the; rotation of the substrate trays to apply a certain film-forming process, and wherein the annular substrate tray, the rotation input section, and the second rotating mechanism are substantially coplanar.

33. (new): A film-forming device with a substrate rotating mechanism, which comprises:
a susceptor in the form of a circular disk and provided at an outer periphery thereof with a revolution input section, the susceptor including no rotational shaft at the center thereof;
a base plate positioned below the susceptor and rotatably retaining the susceptor via a bearing supported between bearing grooves each provided at the susceptor and the base plate;
a first rotating mechanism including at least one revolution generating section, the revolution generating section rotating the susceptor at the outer periphery of the susceptor by way of generating a rotating force at the revolution input section wherein the revolution generating section and susceptor are coplanar;
a plurality of substrate tray retaining sections positioned circumferentially around a rotation axis of the susceptor;

a plurality of annular substrate trays provided at an outer periphery thereof with a rotation input section and rotatably supported in the corresponding substrate tray retaining sections for supporting a plurality of substrates;

a second rotating mechanism including a rotation generating section, the rotation generating section rotating the substrate trays by way of generating a rotating force at each rotation input section, a plurality of the substrates being supported in the corresponding substrate trays, the substrates being revolved by the rotation of the susceptor and rotated by the rotation of the substrate trays to apply a certain film-forming process;

a reacting chamber extending across the -rotation axis; of the susceptor and surrounding the substrate tray retaining sections; and

a temperature control mechanism positioned in the reacting chamber.

34. (new): A film-forming device with a substrate rotating mechanism, which comprises:

a susceptor in the form of a circular disk and provided at an outer periphery thereof with a revolution input section;

a base plate positioned below the susceptor and rotatably retaining the susceptor via a bearing supported between bearing grooves each provided at the susceptor and the base plate to provide a non-rotational shaft structure at a center of the susceptor;

a first rotating mechanism including at least one revolution generating section, the revolution generating section rotating the susceptor at the outer periphery of the susceptor by

way of generating a rotating force at the revolution input section wherein the revolution generating section and susceptor are coplanar;

a plurality of substrate trays retaining sections positioned circumferentially around a rotation axis of the susceptor;

a plurality of annular substrate trays provided at an outer periphery thereof with a rotation input section and rotatably supported in the corresponding substrate tray retaining sections for supporting a plurality of substrates;

a second rotating mechanism. including a rotation generating section, the rotation generating section rotating the substrate trays by way of generating a rotating force at each rotation input section, a plurality of the substrates being supported in the corresponding substrate trays, the substrates being revolved by the rotation of the susceptor and rotated by the rotation of the substrate trays to apply a certain film-forming process;

a reacting chamber extending across the rotation axis of the susceptor and surrounding the substrate tray retaining sections; and

a temperature control mechanism positioned in the reacting chamber.

35. (new): A film-forming device with a substrate rotating mechanism, which comprises:

a susceptor in the form of a circular disk and provided at an outer periphery thereof with a revolution input section;

a base plate positioned below the susceptor and rotatably retaining the susceptor via a bearing supported between bearing grooves each provided at the susceptor and the base plate;

a first rotating mechanism including at least one revolution generating section, the revolution generating section rotating the susceptor at the outer periphery of the susceptor by way of; generating a rotating force at the revolution input section wherein the revolution generating section and susceptor are coplanar;

a plurality of substrate trays retaining sections positioned circumferentially around a rotation axis of the susceptor;

a plurality of annular substrate trays provided at an outer periphery thereof with a rotation input section and rotatably supported in the corresponding substrate tray retaining sections for supporting a plurality of substrates;

a second rotating mechanism including a rotation generating section, the rotation generating section rotating the substrate trays by way of generating a rotating force at each rotation input section, a plurality of the substrates being supported in the corresponding substrate trays, the substrates being revolved by the rotation of the susceptor and rotated by the rotation of the substrate trays to apply a certain film-forming process;

a reacting chamber extending across the rotation axis of the susceptor and surrounding the substrate tray retaining sections, upper and lower planes on the susceptor within the outer periphery thereof being entirely exposed to the reacting chamber; and

a temperature control mechanism positioned in the reacting chamber.

36. (new): A film-forming device with a substrate rotating mechanism, which comprises:

a susceptor in the form of a circular disk and provided at an outer periphery thereof with a revolution input section;

a base plate positioned below the susceptor and rotatably retaining the susceptor via a bearing supported between bearing grooves each provided at the susceptor and the base plate;

a first rotating mechanism including at least one revolution generating section, the revolution generating section rotating the susceptor at the outer periphery of the susceptor by way of generating a rotating force at the revolution input section;

a plurality of substrate trays retaining sections positioned circumferentially around a rotation axis of the susceptor;

a plurality of annular substrate trays provided at an outer periphery thereof with a rotation input section and rotatably supported in the corresponding substrate tray retaining sections for supporting a plurality of substrates;

a second rotating mechanism including a rotation generating section, the rotation generating section rotating the substrate trays by way of generating a rotating force at each rotation input section, a plurality of the substrates being supported in the corresponding substrate trays, the substrates being revolved by the rotation of the susceptor and rotated by the rotation of the substrate trays :to apply a certain film-forming process;

a reacting chamber extending across the rotation axis of the susceptor and surrounding the substrate tray retaining sections; and

temperature control means in the reacting chamber for actually controlling a temperature distribution over one of upper and lower planes on the susceptor within the outer periphery

thereof, wherein the other one of upper and lower planes at least at a center of the susceptor directly faces the temperature control means.

37. (new): The film-forming device as claimed in claim 36, wherein the other one of upper and lower planes within the outer periphery of the susceptor entirely, directly faces the temperature control means.

38. (new): A film-forming device with a substrate rotating mechanism, which comprises:
a susceptor in the form of a circular disk and provided at an outer periphery thereof with a revolution input section;

a base plate positioned below the susceptor and rotatably retaining the susceptor via a bearing supported between annular bearing grooves each provided at the susceptor and the base plate to provide a non-rotational shaft structure at a center of the susceptor, the groove provided at the base plate comprising a lower support portion and an inner support portion extending in parallel to an axis of the rotatably retained susceptor for supporting the bearing outwardly from the axis of the rotatably retained susceptor, the groove, provided at the susceptor, substantially consisting of an upper support portion and an outer support portion extending in parallel to the axis for supporting the bearing inwardly with respect to an axis of the rotatably retained susceptor to rotate the susceptor with stable support of the susceptor irrespective of temperature variation;

a first rotating mechanism including at least one revolution generating section, the revolution generating section rotating the susceptor at the outer periphery of the susceptor by way of generating a rotating force at the revolution input section Wherein the revolution generating section and susceptor are coplanar;

a plurality of substrate trays retaining sections positioned circumferentially around a rotation axis of the susceptor;

a plurality of annular substrate trays provided at an outer periphery thereof with a rotation input section and rotatably supported in the corresponding substrate tray retaining sections for supporting a plurality of substrates;

a second rotating mechanism including a rotation generating section, the rotation generating section rotating the substrate trays by way of generating a rotating force at each rotation input section, a plurality of the substrates being supported in the corresponding substrate trays, the substrates being revolved by the rotation of the susceptor and rotated by the rotation of the substrate tray's to apply a certain film-forming process;

a reacting chamber extending across the rotation axis of the susceptor and surrounding the substrate tray retaining sections, upper and lower planes on the susceptor within the outer periphery thereof being entirely exposed to the reacting chamber; and

a temperature control means in the reacting chamber for actually controlling, by infrared radiation, a temperature distribution over one of upper and lower planes on the susceptor within the outer periphery thereof, wherein the other one of upper and lower planes at least at a center of the susceptor directly faces the temperature control element with respect to the heat radiation,

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Appln: No. 10/002,177

wherein the other one of upper and lower planes within the outer periphery of the susceptor entirely, directly faces the temperature control element, wherein the revolution generating section is positioned outside the outer periphery of the susceptor in a radial direction of the susceptor, wherein the annular substrate tray, the rotation input section, and the second rotating mechanism are substantially coplanar, wherein the susceptor is provided at a center portion with an opening as a part of the non-rotational shaft structure, and the opening is selectively covered by a cap member to control the temperature distribution.